

AMERICAN

JUNE • 1958

# Cinematographer

THE MAGAZINE OF MOTION PICTURE PHOTOGRAPHY



*IN THIS ISSUE*

- Filming "The Lineup" On Location
- Dramatic Emphasis With The Mobile Camera
- Theatre Screen Textbook for Film Maker

35c

FOREIGN 45c

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6.5mm f/1.5	5.00	5.00	5.00	5.00
7.0mm f/1.5	5.00	5.00	5.00	5.00
7.5mm f/1.5	5.00	5.00	5.00	5.00
8.0mm f/1.5	5.00	5.00	5.00	5.00
8.5mm f/1.5	5.00	5.00	5.00	5.00
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## INDUSTRY NEWS

News briefs of  
industry activities,  
products and progress.



THE NEW R-30 is on sight

Photolamps, like flashbulbs, are being reduced in size, made more compact and efficient. First result of this miniaturization is Sylvania Electric Products' R-30, with R-30 pictured above compared to its old style R-34 counterpart.

Exterior of the new lamp's neck is fitted blue and internal construction includes a disc and special filament designed to minimize the occurrence of flaring and blackening. Lamp is ideally suited to all types of motion picture photography where small photolamps and related equipment are desirable. List price of new lamp is \$1.50. Available June 1st.

★

Current production trend in horror, fantastic, and science-fiction films has attracted Dutch inventors, who last month closed deal with Venture Films, Inc., for exclusive use of its new Dynascope system—a new film process by which outside figures, people or animals, whether blown up to giant proportions or shrunk to a few inches in height, can be photographed in live action scenes along with figures of normal size.

New system uses two lenses on camera and producers, in conjunction with an arrangement of mirrors and prisms, two separate images on a single frame of film, thus bypassing need for traveling mattes, processing screens, and animation in special effects shots.

Jack Polakoff has been signed to produce the first two feature films scheduled to use the process—"The Amazing 12-1/2 Inch People" and "The Boris Snatchers."

★

Still better lenses for cameras are promised in the development of a new "rare earth" optical glass, according to Walter

H. Pienstorf, commercial director of the Schott glass works at Mainz, Germany. The new glass reportedly can be produced in industrial quantities.

Lenses of future made of the "new earth" optical glass, according to Mr. Pienstorf, will be marked by improved resolution across the entire field—significant in color photography.

Eastman Kodak Company reportedly has also pioneered in the development of "new earth" elements for the production of optics since the late thirties.

★

Limco Industries of Beverly Hills, Calif., last month completed negotiations for the purchase of Western, Western Electric Company subsidiary devoted to electronics, and particularly the sound equipment used in the motion picture industry.

Limco Industries specializes in the manufacture of computers, data processing equipment, communications and navigation apparatus, business machines, microwave tubes and electronic components. Its R-500 employees are stationed over 17 domestic manufacturing plants and research labs and in a plant in Amsterdam, Holland. Acquisition of Western will add 1,300 employees and 35 offices in foreign countries to organization.

★

Video-tape recording is freeing motion picture facilities for a greater volume of the kind of work tape is not wanted to handle, according to Saul Jeffrey, founder of Mevlab Color Laboratories, New York.

"The competition between tape and film has already had the result of moving more motion picture production out of the studio into real locales," Jeffrey said.

Special effects is still a real problem in the production of video-tape pictures, it was pointed out. "More and more of the million-foot daily film processing of our laboratories comprises films having special optical effects, animation and other combinations," Jeffrey explained further, and added that while there is no doubt that a portion of this might ultimately be accomplished with considerable effort on tape, it is so routine a matter on film that the latter method is preferred.

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# WHAT'S NEW

... in equipment, accessories, services



**Intervalometer**

Kling Photo Corp., 257 Fourth Ave., New York 10, N.Y., announces an intervalometer for use with the Arriflex-16 camera in making time-lapse motion pictures. Unit has motor-driven timer and operates from 110-V, 60 cycle AC current. Unit also provides for 8-V DC, uprate so whole system of Arriflex-16 equipment may be used with convenience. Three models provide intervals from 5 seconds to 20 minutes; 12 seconds to 50 minutes; and 2 minutes to 10 hours—plus intervals of 2 and 4 seconds. Weight is approximately 14 lbs.; size is  $8\frac{1}{2} \times 5\frac{1}{4} \times 10\frac{1}{4}$ "'; list price is \$195.00.



**Transistor Recorder**

Hallex Electronics, 332 No. La Brea Ave., Los Angeles 36, Calif., announces its new Model 1216 all-transistorized professional magnetic film recorder. Features include encapsulated modular plug-in amplifier sections, 1200-ft. film capacity, and one-race compactness. Frequency response is 30 to 12,000 cps. Amplification is ample so "long shots" can be made with any professional-type make without need for extra amplifiers

or mixer. Amplifier may be powered by 24-V batteries or regular AC. Recorder is available for 16mm, 17 $\frac{1}{2}$ mm, or 35mm magnetic film, portable or rack-mounted.

## **New Kodak Lens**

Eastman Kodak Company announces a new f/1.9 short focal length, wide-angle lens in standard Type D mount for 8mm cine cameras. Lens is fixed focus, laminated, with positive click-stops from f/1.9 to f/16. Front and rear lens caps are provided. Lens also accepts Kodak Combination lens attachments Series 5 with No. 22 screw-in adapter ring. List price is \$54.50, including federal tax.



**Remote Control Head**

Hobbs-Francis Corp., 11805 West Olympic Blvd., Los Angeles 64, Calif., announces a new remote control head for small industrial-TV cameras weighing up to 20 lbs. Powered by two 10-disc motors, head will tilt camera up or down 45° or rotate 370°. It can also be operated in vertical position. Speed of movements is 2° per second in elevation;  $3\frac{1}{2}$ ° per second in azimuth. Two toggle switches control movements at tripod or at remote location, as desired.

## **Tape Splicer**

Camera Equipment Co., New York, N.Y., announces availability of the Accu-Tape Splicer. Model II for use with all types of motion picture films, including Cinemascope. Features include reusable cutting blade which prevents tearing and bending of film. Depressed by pushbutton, blade springs back after cut is made. Grease bars in the base



force film lock up also splice is completed. Nonmagnetic construction insures safety of magnetic striped films and magnetic sound films. Unit makes strong butt or lap splices, straight or diagonal without heat or use of cement. Film pins are adjustable to accommodate film widths from 8mm to 70mm. List price is \$125.00.



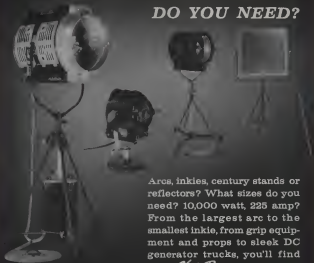
**Cinetron Converter**

S.O.S. Cinemas Supply Corp., New York, is distributing the new Cinetron power converter, a heavy-duty unit that provides a great amount of lighting power from a limited power source. Cinetron multiplies both intensity and color temperature of standard long-life lamps to the levels required for good photography. Up to 45 150-watt RFL lamps may be used simultaneously on the unit's 220-volt A.C. output with satisfactory color temperature. Full price is \$189.00. Data sheet is available.

**Personnel notes:** Victor M. Salter promoted sales-service supervisor for DuPont photo products at Patuxent, N.J. . . . Harlan Graham, same company, has been named sales director of DuPont photo products. . . . Joseph H. Tansley, head of S.O.S. Cinemas Supply Corp., last month was re-elected Chairman of Motion Picture Industry Credit Group. . . . Bruce & Sawyer, Los Angeles, has opened regional sales office at 3025 Bryan, Dallas, Texas.



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*Lans*

Mr. Lansburgh is famous for his productions made under extreme, rugged conditions -- in jungles, deserts, mountains -- and relies on the famous Magnasync equipment for perfection in recording, storing and re-recording for "Wetback Hound" was performed by Glen Glenn Sound Company -- also users of Magnasync equipment



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News briefs about the A.S.C.

its members, and inspectors'

industry personalities



VAUGHN C. SHAWER (left) and Walter C. Farley (right) explain the points of Andrew Kudof's new 14mm Ektachrome film to screen director Rudolph Wale at May dinner-meetings of ABC. Shawer and Farley, along with GE's Dr. Howard Simmons, spoke in the evening, were distributed left as new film.

**Ray June, ASC**, 63, veteran cinematographer who during his more than 30 years in Hollywood photographed most of the top stars, died May 26th from a heart attack. A native of Ithaca, N.Y., June began his career shadowing silent films for the late Marshall Neilan. He shot his first talk-

member of the A.S.C. since 1927, June moved to MGM in 1936 and remained with that studio until 1954. His last cinematographic assignment was "Homeboat" at Paramount Studio, Hollywood. Survivors are his wife, Katherine



WHEN DON MALEKOWSKI, ASC, isn't shooting TV films in New York, he's busy adding to his collection of antique motion picture cameras, said to be his largest and most valuable collection in the world.

Benjamin Berg, ASC, and Mrs. Berg made a combined business/pleasure trip



**ACES NEW PREXY**, Walter Strong, was in good form as he officiated at last meeting following his election. One of last official steps was to set in motion plans for ACES' forthcoming Annual Ladies Night Dinner and Dance to be held at Grandy-Midway Hotel, Quebec 17th.

to Europe last month. They visited important lens and camera factories in England, France, Belgium and Switzerland.

**Walter Stronge**, ASC president, last month was elected to Board of Governors of Los Angeles Chapter of Academy of TV Arts and Sciences. **Farron Edouart**, ASC, and **Hal Mohr**, ASC, were named to Board of Governors of the Academy of Motion Picture Arts and Sciences to represent the industry's cinematographers.

Clark Ramsey, ASC, who appeared together with a lady friend in a photo in this department of our January issue has called attention to our error in referring to friend as caption as "Mrs. Clark Ramsey." Clark's still a bachelor.



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Walt Disney Productions, Burbank, Calif. (in production)

Generalized Film Labs., Ft. Lee, N.J.  
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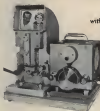
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# Photographic Assignments

Who, where and what the industry's cameramen were shooting last month

\*Asterisks indicate commercial and television film productions

## ALLIED ARTISTS

• FLOYD CRONIN, ASC, "The Fox Wanderers" (Landscape Picture Prods.) with Barry Sullivan and Peter Graves. Harmon Jones, director.

## AMERICAN NATIONAL

• MORRIS ARONSON, "Sea Hunt" (Ziv-TV) with Lloyd Bridges. Various directors.  
• "Tarzan" (Ziv-TV) with Adolphe Menjou. Otto Lang, director.  
• GUY FETTER, "Tarzan" (Ziv-TV) with Adolphe Menjou. Otto Lang, director.  
• BOB HOFFMAN, "Timezone Territory" (Ziv-TV) with Pat Conway. Various directors.

## CALIFORNIA STUDIOS

• FLEET SOUTHGATE, "Here Can We Tell You" (Filmaster Prods.), with Richard Boone. Various directors.  
• "Gunsmoke" (Filmaster Prods.) with James Arness and Deane Keeton. Richard Wharf, director.  
• HOWARD SCHWARTZ, "Here Can We Tell You" (Filmaster Prods.) with Richard Boone. Lambert Johnson, director.

## COLUMBIA

• GUY ARONSON, ASC, "Shirley Temple's Storybook" (Sonoma Group) with Shirley Temple. Harry Hammer, director.  
• KIP CARSON, "Father Knows Best" (Sonoma Group) with Robert Young and Jane Wyatt. Peter Torkelson, director.  
• RICHIE FREEDMAN, ASC, "Behind Closed Doors" (Sonoma Group) with Paul Wendell, director.  
• DENNIS DE MARCO" (Gold, Sonoma Group) William Russell, director.  
• JOHN JACKMAN, "Adventures of Rin Tin Tin" (Sonoma Group) with Lee Aaker and James Brown. Various directors.  
• CHARLES LAWTON, ASC, "Father Knows Best" (Sonoma Group) with Robert Young and Jane Wyatt. Peter Torkelson, director.  
• "Miss Gandy Jones" with Doree Day and Jack Lemmon. Richard Quinn, producer-director.

• TED MOORE, "The Man Inside" (Warlock Prods.) shooting in Sonoma with Jack Palance and Anita Ekberg. John Gilling, director.  
• TED SEARS, "The Clock Without a Face" (shooting in London) with Jack Hawkins and Gus Seals. Andre De Toth, director.

• LORRIS WORTH, ASC, "Jefferson Drum" (Sonoma Group) with Jeff Richards. Various directors.

## WALT DISNEY

• LLOYD GARBER, ASC, "Tricks" with Sal Mineo and Faye Parker. Lewis K. Foster, director.  
• WINTON HOGG, ASC, "Darcy O'Gill and the Little People" (Walt Disney Prods. for Buena Vista) with Albert Smithee and Janet Maize. Robert Stevenson, director.

## FLUORAC FILMS

• VINCE MILLER, ASC, "You Bet Your Life" with Groucho Marx. Robert Dean, director.

## FOX WEITHEA AVE

• LLOYD ARONSON, ASC, "How to Marry a Millionaire" Various directors.  
• FRANK FORDMAN, ASC, "The Party Makers Show" with Raymond Burr. Various directors.  
• CHARLES VAN ECKE, ASC, "Men Without Guns" with Rex Brown. Various directors.

## GENERAL SERVICE

• NEAL BECKNER, "The Adventures of Ozzie & Harriet" (Stage 5 Prods.) with Ozzie, Harriet, David, and Ricky Nelson. Ozzie Nelson, director.  
• ROBERT SHARP, ASC, "Build January" (Advisory Prods.) Leon Kasha, director.  
• JAMES VAN TREES, ASC, "Blues & Blues Now" (McCadden Prods.) with Gino

Allen and George Burns. Rod Amateau, director.

• HARRY WILE, ASC, "Bob Cummings Show" (Laurance Prods.) with Bob Cummings and Rosemary De Camp. Bob Cummings, director.

## INDEPENDENT

• LUCIEN BALLARD, ASC, "Anna Lucasta" (Landscape Prods. for UA release) with Summy Basso, Jr. and Lucien Ball. Sidney Harmon, producer.

• FLORENCE CRONIN, ASC, "Pucknuss World" (American Intl. Pictures) with Robert Vaughn and Darin Marshall. Roger Gorman, producer-director.

• MAURY GREENMAN, ASC, "Timbalanda" (International Prods. for UA release) with Victor Mature and Yvonne De Carlo. Jacques Tourneur, director.

• CARA GUTTMAN, ASC, "The Big Man on Campus" (CinemaScope color, The Mirisch Co.) with Joel McCrea. Joseph Newman, director.

• SAM LARLEY, ASC, "Pork Chop, Hal" (Melville Prods. UA release) with Gregory Peck and Barry Gardiner. Lewis Meltman, director.

• EDWARD LINDEN, ASC, "I Want to Live" (Futura, Inc. for UA release) with Susan Hayward and Philip Coolidge. Robert Wise, director.

• JACK MARTIN, "The Earth VS. the Spider" (Earth, Inc. Prods. for American International) with Jane Kerry and Gene Pinnau. Ben J. Gansler, director.

• MORRIS NICKELSON, "Frankenstein's Daughter" (Lorton Films. Arco release) with Sandra Knight and Robert Day. Richard E. Cusick, director.

• JOHN NICKELSON, Jr., "Citizens from Galaxy 27" (Rogers-Gordon Prod. for Arco. can. International) with Michael Tolan and Angela Corne. Bernard Kopsky, director.

## KEYWEST STUDIOS

• WALTER SORRENTE, ASC, "This is the Life" (Pinkey Films). William Clinton, director.

## LA BELLA PRODUCTIONS

• HAL MCALPIN, "Chamberlain commercial" (Hark Linder, director). Various commercial and Hughes Aircraft industrial short. Jack Farnham, director.

## LONGLETTIE PLAYHOUSE

• ALAN SCHWARTZ, ASC, "People Are Funny" with Art Linkletter. Ivy Adams, director.

## NETRO-GOLDWYN-MAYER

• LUCIEN ARONSON, ASC, "Silent Service" (Cald. National Prods.). Jean Yarkough, and Sidney Martin, directors.

• ROBERT BROWN, ASC, "Party Girl" with Robert Taylor and Ed Charles. Nicholas Ray, director.

• WILLIAM BARBER, ASC, "On a Hot Tin Roof" (Arco Prods.) with Elizabeth Taylor, Paul Newman and Burl Ives. Richard Brooks, director.

(Continued on Page 360)



## AMERICAN SOCIETY OF CINEMATOGRAPHERS

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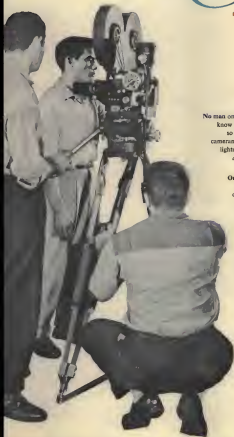
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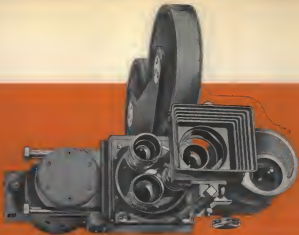
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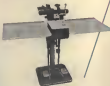


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# TECHNICAL QUESTIONS & ANSWERS

Conducted by Walter Strenge, A.S.C.



**Q**UESTIONS relating to cinematography or other phases of film production are invited from readers and will be answered by letter by Walter Strenge or by other qualified members of the American Society of Cinematographers. Questions and answers considered of general interest will appear in this column.—Ed.

**Q** I have a Bolex H-16 camera. What is the shutter opening, and what exposure does it give?—G.F., Hawaii.

**Answer:** The Bolex camera shutter opening is 190 degrees. The exposure rate, of course, depends upon the camera speed. At 16 frames per second, the exposure per frame is 1/30th of a second. At 24 frames per second, it is 1/48th of a second.—*Walter Strenge, A.S.C.*

**Q** On the MGM production, "Somebody Up There Likes Me," will you please give the following information:

- 1) What types of negative stock were used?
- 2) On what positive stock were the release prints made?
- 3) What lens-to-film-screening combination was adopted on interior illumination?
- 4) What was the general set color of the interiors?
- 5) What filter was usually used for the exterior work?
- 6) What correction makeup was applied on the men and women?

**Answer:** 1) Plus-X and Tri-X. 2) Eastman positive stock. 3) Plus-X; 250 foot cassettes, 1/4 to 1/4.5; Tri-X; 250 foot cassettes, 1/5.6. 4) Gray-Green. 5) Aero-2 filter. 6) The makeup was compounded specially by MGM's makeup department.—*Joseph Rutenberg, A.S.C., Director of Photography of "Somebody Up There Likes Me."*

**Q** Vertical objects appear to shimmer in my pictures photographed in panning action or when such objects pass in front of my camera, which is a 16mm magazine-loaded Bell & Howell with a shutter speed of 1/10th of a second. I cannot reduce the shutter speed, and I believe that I pan slow enough and smoothly, as I use a Miller hydraulic head.

Can I minimize the shimmer results by

shooting at 18 frames per second and projecting at 16? What else can be done?—S.R., Los Angeles, Calif.

**Answer:** Projecting your pictures at slower or faster speeds than they were photographed will not remedy your trouble, because the "shimmer" or strobe effect, as we prefer to call it, is originally photographed as such and changing the speed of projection merely speeds up or slows down the effect.

When photographing scenery or stationary objects, panning speed must be reduced when you change from extreme wide-angle lenses to those of longer focal length—reduce the speed in proportion to the increase in focal length and vice versa. When panning on moving objects such as people, cars, speedboats, trains, etc., no strobe effect will result if you "stay with them"—that is, pan along so you always keep your subject centered in the frame. However, at certain speeds and distances the background will strobe.

It may be helpful to shoot a test with each of your lenses on a scene vast at normal camera speed—starting with a slow pan and gradually speeding it up. Project the test at normal projection speed and note at what point the strobe or "shimmer" effect begins. Then be governed accordingly in shooting in the future.—*Ray Foster, A.S.C.*

**Q** Having not yet seen results, under knowable comparative conditions, of beam color release print quality obtained with the new 16mm negative-positive procedure, as direct comparison with the famous optimum "first generation" printing (i.e., direct from beam Kodachrome original to reversal dupes stock) I must make a choice for a TV color series between these two ink printing procedures.

For other good reasons, filming will be confined for the time being to original on Type A Kodachrome. I can tell that the intermediate negative-positive step affords such more latitude for print control and a "clearer" or otherwise optimum release print. In your opinion which procedure gives optimum print as regards sharpness, color, and contrast control?—R.B.R., Laguna Beach, Calif.

**Answer:** Although this may be a controversial point, my experience in the two  
(Continued on Page 325)



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## **QUESTIONS & ANSWERS**

*(Continued from Page 355)*

medium discussed leads me to believe that use of 7320 interrogative from a Kodachrome original and a subsequent print on 7382 stock offers a number of advantages. Even though this process requires an extra step for the making of the interrogative, the result has been that a true rendition of the colors photographed on the original Kodachrome is obtained and it is then possible to place these colors on a positive print with a better degree of rendition than a direct reversal print.

There is a slight apparent loss of sharpness when compared on a projector screen. This difference was not noticeable on closed-circuit demonstrations I have seen. During the same demonstrations, it was agreed that it was possible to control the colors on the 7382 print for television and obtain what was wanted, whereas this was not necessarily so with the reversal print. Also, the contrast of the 7382 print appeared better suited for the system in which we were viewing the film.

The experimentation which resulted in the above opinion was done with the cooperation of one of the large TV networks. The same results would be obtainable if the same care is taken to control the system to the film used.—*Ted Fogelman, A.S.C. Associate*

**Q** As a camera lens, even at its widest aperture, has a certain amount of depth of field, why is it that a projector lens—even one of the same focal length—cannot be critically focused to obtain a sharp image on the screen? The only reason I can think of is that the projector lens and screen, in effect, comprise a huge camera having a negative comparable in size to the screen. Am I right or wrong?—*R. S. DeL., Dayton, Ohio*

**Answer:** In a camera, the film is held stationary in the aperture during the interval the shutter is open. With a projector, this is not the case. Curl of the image, during projection, therefore determines the best average setting of the lens for focus. For this reason, it is impractical to calibrate projection lenses.

The best setting of the projection lens will vary for color, black-and-white, lamp adjustment, number of feet the film has been projected, humidity, etc. The optics of the two systems can be compared only as a first approximation, based on the false assumption that the image lies in a flat plane during projection.—*Stanley Horley, A.S.C.*





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## PHOTOGRAPHIC ASSIGNMENTS

(Continued from Page 284)

### WITBO-GOLDWYN-MATHE

• **GEORGE FOLGER, ASC**, "Torpedo Run" with Glenn Ford, Ernest Borgnine and Dean Jones. Joseph Pivney, director.

• **HAROLD MANDERL, ASC**, "The End of the World" (Sel Sogod-Har-Bel Prod.) with Harry Belafonte, Inger Stevens and Mel Ferrer. Ronald MacDougall, director.

• **HARRISON SMITH**, "Northwest Passage" with Kirk Larson. Allen Crookall, director.

• **WILLIAM SPENCER, Jr.**, "The Thin Man" with Peter Lawford and Phyllis Kirk. William Asher, director. Langford, Frasier & Gumbel and Kraft later reassemble. Robert Lacey, director.

• **WILLIAM SPENCER, Jr.**, "Andy Hardy Comes Home" (Fremont Ent.) with Mackay Roney and Fay Holden. Howard W. Koch, director.

• **ROBERT SUTTON, ASC**, "Big Hat" (Metropolitan Camera Co., shooting in Italy) with Charles Bronson and Jack Hawkins. William Wyle, director.

### MOTION PICTURE CENTER

• **CHARLES BRUCE**, "The Real McCoy" (Universal-Wantage Prod.) by Arthur, director.

• **SHANE CARROLLMAN**, "Whispering" (Dasha Prod.) with Kenneth Tobey and Craig Eby. Various directors.

• **BRUCE McGRATH, ASC**, "Ten Per Acre" (Polo) Dasha Prod.; Jerry Thorpe, director. "Daisy Thomas commercial" Alan Lee, director.

• **ERWIN HAMMERMILL**, "Lullaby Ball & Don Aron Shum" (Dasha Prod.) with Lullaby Ball & Don Aron. Jerry Thorpe, director.

• **NICK MORROW, ASC**, "The Love Up" (Dasha Prod.) with Warren Anderson and Tom Yell. Various directors.

• **JOE NEPHE, ASC**, "The Walter Winchell File" (Dasha Prod.) with Walter Winchell. Alvin Gansel, director.

• **ROBERT PUTTACE, ASC**, "The Californians" (Dasha Prod.) with Richard Longa. Byron Block, director.

### PARAMOUNT

• **HAROLD ROSS**, "I Married a Monster From Outer Space" with Tom Tryon and Gloria Talbott. Gene Fowler, Jr., director.

• **ERNEST FIDELLER, ASC**, "The Party Crasher" with Leslie Stevens and Charles Stevens. Richard Garay, director.

• **CHARLES LANG, ASC**, "Showdown in Gun Hill" (Vine-Vine) with Kirk Douglas and Anthony Quinn. John Shager, director.

• **ALDO TORTI**, "The Tempest" (Delacorte Prod., Technicolor Technicolor, shooting in Rome) with Van Heflin, Geoffrey Home and Sylvia Maingo. Alberto Lattuada, director.

### PARAMOUNT SUMMIT

• **JACK MACKENZIE, ASC**, "Sue Troop" (Revue Prod.) with Bud Carson. Various directors.

(Continued on Page 282)

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WITH ONE EYE on the weather and the other on action before his camera, Nick Musuraca, A.S.C. [left] maintains fast pace shooting location exteriors in San Francisco for "The Lineup."

**E**VEN THOUGH HE has been photographing "The Lineup" series of TV films for the past four years, cinematographer Nick Musuraca, A.S.C., has no intention of abandoning cinematography for a director's career. "Scheming up ways to get the shots we need in spite of the erratic weather encountered," he says, "is just as challenging as any crime case tossed in the laps of the San Francisco detectives, whose real life adventure 'The Lineup' delineates." One has only to view a "Lineup" story on television to appreciate this statement.

Nick Musuraca is credited with having shot more location

## Rain, Fog Nor Wind Ever Slows Location Shooting For "The Lineup"

Keeping exposure uniform despite ever-changing weather and light conditions is biggest problem.

By CLIFFORD G. HARRINGTON

footage in the city of San Francisco than any other Hollywood cameraman. Yet on a recent day off in that city, he almost lost his way. This is not surprising when you consider that, in shooting exteriors for the "Lineup" series, he has little time to concentrate on anything but the photographic problems at hand. So absorbed does he get in his work, that often he is unaware of the name of the street on which the company is working, a company car takes him to and from location daily.

"The Lineup" is one of the few Hollywood-produced TV shows in which the greater part of the action is filmed away

UN-BUMPED MITCHEL "MC" camera is always used for "Lineup" location shooting to facilitate quick breakdown and moving.



MUSURACA (right, top) works closely with his operator Fred Rudy in lining up shot of players Tom Tully and Warren Anderson.



from Hollywood. During a typical day's shooting, Muscarel and his crew may photograph portions of four different shows in as many locations. The company works six days a week while in San Francisco, until all location shots for eight half-hour TV shows have been completed, which usually requires about eleven days. The company then returns to the Desilu Studio in Hollywood to photograph the required interiors for the shows. This procedure continues until the thirty-five films in the year's series have been completed.

Because of the tight schedule which the "Lineup" company follows, action shots must be filmed in fog, rain, and sometimes in heavy wind. Once, it rained continuously for a week. On one of these days the company had to go out and shoot a sequence that called for a number of low-angle shots, with the Mitchell camera mounted either on a baby tripod or a hi-hat. Muscarel offered little or no protection and at the end of the day, every man was soaked to the skin. But the results were worth it: the rain and overcast lent a unique pastoral touch to the whole sequence and enhanced the sinister mood of the action.

Indeed San Francisco's famous fog often plays an important, if not unexpected part, in many of "The Lineup" films. One day when Muscarel was set up for an important dolls shot, fog suddenly swirled in from the bay and obliterated the area. Later it seemed to lift, then clear down again. Then the fog began to move in patches. Muscarel seized an unusual pictorial opportunity in this and suggested the company start shooting at once. The action involved a girl who was about to be shot, and who was attempting to elude her assailant. The suspense was heightened by having the girl move in and out of the vagrant fog banks, and Muscarel achieved an unique photographic result that would have been difficult as well as expensive to create artificially at the studio.

There have been times when the weather and light have changed so drastically during a single day that Muscarel has had to resort to every trick in the book in order to make his takes match for lighting. Like the time an automobile that figured prominently in one sequence was driven from rain to sunshine and back to rain again. Expert use of filters and camera angles were employed as these variations would hardly be noticed on the TV screen.

Recently, Muscarel and his crew were filming a sequence at a restaurant on the Coast Highway, which runs along the coast beginning at the Fleishacker Zoo. Minutes after the last shot was made, the company moved to the Zoo and began shooting scenes for another episode in the series.

(Continued on Page 378)



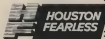
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THE EFFECT OR RESULTS of the various motion picture lighting techniques is better understood when observed on the theatre screen. In above scene from "The Wrong Man," photographed by Robert Suris, ASC, the part played by the No. 1 key light is plainly visible while the separation or modeling effect achieved by backlighting can be seen in the rim light playing on the heads and hands of the three men at left. Also pointed out is manner in which upper wall area at rear is selected for improved pictorial effect.

come one of Hollywood's top light directors of photography, winning Academy Awards on three occasions for his photographic achievements.

The same classroom—the motion picture theatre—in which this professional learned some of the most important techniques of cinematography, is available to every aspiring motion picture cameraman. There are many good textbooks available on the subject—and they are important—but studying cinematography on the screen can do more for the student than any written treatise because it shows examples of established cinematographer technique which, when properly analyzed, both inspire and educate the student.

By learning how to observe the theatrical film with an analytical eye and to probe the techniques that were employed in its making, the student cinematographer can pick up many fine points on lighting, camera angles, scene composition, camera and subject movement, and general production techniques. The essent of one's learning, of course, lies not in merely observing what is on the screen so much as questioning and attempting to analyze why certain techniques were employed, and to ask: "Why was the action thus composed, lighted and photographed?" In time, the student-observer will learn to think like a professional and be able to solve any photographic problem of his own with good cinematic logic.

Because, in most cases, more skill, time and lighting craftsmanship must be employed in lighting and photo-

## Theatre Screen Your Best Textbook If You Want To Learn Lighting

All the professional's techniques are there for  
the student to see, study and analyze.

By JOSEPH V. MASCELLI

ONE OF THE INDUSTRY'S most notable cinematographers credits the motion picture screen for much of his early instruction in motion picture photography. "At the time," he says, "I was particularly impressed with the work of Hollywood's then leading cinematographer. I studied his technique by going

to the theatre and observing the way he shot his pictures. I learned how he lit his interiors by carefully noting the direction of light sources and the way the shadows fell. Then I would try to apply the same methods in my own work and where possible to improve upon them." Eventually this man went on to be-



GRAGRA, mounted before lamp. Upper right looks up directly and flames of light, to line in places in doorway and on man adjacent to them. Note, also how other "candle" have been employed to create a subtle pattern of shadows on floor in background. Scene is from "Baby Doll," photographed by Aron Kurland, ASC.



graphing a black-and-white production than one in color, black-and-white films afford the student more observable illustrations of camera and lighting techniques. This is because with color films—except very high-budgeted feature productions—lighting plays a less-dominant part in modeling, separation, etc., because these factors already exist in the scene to a great extent by virtue of the natural contrast that exists between colors. In black-and-white photography, black and white must be broken up into gradations of each to create a range of brilliances, shadows and highlights. These are some of the important things to look for, then, when studying cinematography on the theatre screen.

One thing to remember is that nearly all of Hollywood's veteran cinematographers learned their art shooting in black-and-white. Many motion picture photographers whose experience began with shooting color—such as a great many of the men presently in *It Happened One Night* production, for example, and who now are doing most of their work with Kodachrome, Ektachrome, Amecochrome or Eumecolor—have a great deal yet to learn about lighting for cinematography, because straightforward color photography (with its inherently natural color contrasts) is entirely adequate for the type of film they are engaged to photograph.

Unfortunately, when studying the photography of a picture on a theatre screen, there is no way of telling what particular set lighting units were used for illumination and various lighting effects. It is sufficient, however, to observe from what direction the lighting comes—the key light, back light, fill light, etc. When you observe this and carefully catalog the information in your mind for possible use of your own, you can employ your own best judgment as to the lighting units to use when trying for the same effect in your own pictures—just as did the Academy-award winners cited earlier.

It would be impractical for anyone to attempt to set down as a text book, explicit instructions as to exactly the types and numbers of units to use to light a set, nor when and how to use diffusers, screens, gels, gobos and other set lighting accessories, because each set-lighting problem is different—even with the simplest, low-budget production.

The important thing is to learn all you can about the various types of set-lighting units—their coverage, typical use, power, and—for color photography—their color temperature. With this knowledge, your imagination and ingenuity will enable you to do the rest. Remember how the effect you desire looked on the screen when achieved by

one of the professionals, then try to copy it. And perhaps improve on it.

One of the things to be observed on the screen is the way the professional always lights his interiors so they appear to be illuminated naturally by the "source light"—i.e., daylight coming through windows, light from an overhead chandelier or a table lamp or wall bracket, etc. To achieve this illusion, the set-lighting units must be carefully placed to produce light of comparable intensity and direction. One devotes from that procedure only when some special lighting effect is desired to enhance the mood of the story or some particular sequence, or to point up some dramatic action.

By observing how the shadows fall in a scene, one can determine the approximate angle and position of the key light that was used. An interesting characteristic, also, is how seldom strong front lighting is used today; most of the light comes from overhead, from the side or from the rear—as dictated by the aim for source light illusion.

An important technique in most all cinematography where persons appear in the scenes is the use of back-cream light for separation—"back-lighting" as it is often termed. A spot set high at the back or side of the set throws light on the head and shoulders of the principal

player or players, thus creating greater separation from the background and at the same time enhancing the overall pictorial effect. The light from such lamps is kept from reaching the camera lens by use of barn doors attached to the lighting unit, a gobo, or both. The barn doors, properly adjusted, cut the lamp beam to the desired width or height to illuminate only the area desired.

Still another technique that is observable only through concentrated attention on the screen, is that employed to keep the light constant on a player as he moves away from or toward the camera. Here a dimmer-board or "dimmer bank" as it is also termed, is employed on the set to increase or decrease intensity of the key light. Were this practice not followed, the player's image would "wash out" or fade up on the screen as he approached the camera (and the key light, usually placed at the side of and above the camera.)

The reason one rarely sees flat lighting on interior scenes on theatre screens is that the professional invariably lights his sets—particularly the larger ones—in contrasting planes. Objects and areas at various distances from the camera are lit in varying degrees of intensity—and sometimes from different directions—as when light appears to come

(Continued on Page 385)

SCENE FROM "My Country 'Tis of Thee" (Business scene lighting techniques of Joseph LaShelle who filmed this black-and-white production for Fox. Here key light falling on player at left suggests light coming from an overhead fixture. The effect of some lighting is shown planes of depth in scene is indicated at (7) and (11), while the familiar position of overhead light falling on upper wall scene is evident at (12). The modeling effect of back-lighting is also evident on figure at left.





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TWO EXAMPLES of films superimposed by photo-resist method showing results on light background (left) and predominantly dark background, opposite. New method is ideally suited to capturing



and lab-filing foreign-language films in English as for superimposing foreign-language description on English-language films intended for foreign exhibition.

## Adding Titles To Processed Films

A photo-resist method for superimposing main or sub titles on Kodachrome, Ektachrome, Eastman Color Print Film or black-and-white films.

By W. I. KISNER and J. J. MURRAY

Eastman Kodak Company, Rochester, New York

IT IS FREQUENTLY desired to add titles or various types of line images to processed films containing picture images. Such superimpositions are used for a number of purposes, including captioning of motion-picture release prints with foreign language titles, preparation of reels for slidefilms and individual transparencies and addition of continuous or dotted lines, insignias, arrows and other symbols to slides used for lectures, television transmissions, etc.

Presently used commercial methods of adding titles to processed films utilize a metal stamp containing the type matter. In one method, the stamp is heated to a temperature which is high enough to melt the emulsion layer or layers of the film as it is pressed against it, thus

removing the emulsion from the areas occupied by the type matter. In another method, the emulsion layer of the film is first coated with wax. The metal stamp, heated to a somewhat lower temperature than in the previous method, is pressed against the coated surface and the wax is thereby selectively removed. The film is then treated with a solution of sodium hypochlorite, or other oxidizing agent, which removes the emulsion not protected by the wax.

The method described in this paper eliminates the need for using the metal type and also the need for heating of stamps or other types of stencils. In this method, a photo-resist image is used in place of wax to protect the film in the desired areas. Formation of the image by photographic rather than mechanical means yields titles having better sharpness characteristics than those obtained by the other methods. The procedure involves preparation of a black-and-white title positive, coating of the film with a photo-resist material, exposure and de-

velopment of the resist, selective removal of the title images by the action of destructive solutions and, finally, removal of the resist.

The resist material used in this method is Kodak Photo Resist (KPR). This is an all plastic, preexposed, liquid surface-coating material used in photo-mechanical reproduction. It serves as an acid-resistant material in various etching techniques and also as an ink-receptive material for preparing surface-type photo-lithographic plates. KPR adheres well to various types of surfaces and is capable of reproducing fine image detail. Any method of application capable of giving a smooth coating may be used, such as spraying, dipping, whirling or rolling. An area of about 400 sq. ft. can be effectively spray coated with one gallon of KPR. In the use described here, this is equivalent to about 3,500 ft. of 35mm film per gal.

After drying, the coated surface is waterproof and resistant to all common

(Continued on Page 388)

A paper presented October 4, 1957 at the SMPTE Convention at Philadelphia, Pa., by the authors and published in the *Journal of the SMPTE* for November, 1957 under the title, "Superimposed Titles on Black And-White and Color Films by a Photo-resist Method." It is reprinted here by permission.



WITHOUT BENEFIT of parallel, cinematographer Miki Carter set up his tripod-mounted Ardis-25 in shallow water to make effective low-

angle shots of Tarzan (out of picture) in dramatic swimming action for "Tarzan's Fight For Life."

## ASSIGNMENT IN AFRICA

Shooting location footage for "Tarzan" holds as many risks for the cameraman as it does for the story's hero.

By CLIFF FORD

**A**LMOST ANY CAMERAMAN can handle a filming assignment in a civilized foreign land, but it takes a specialist to undertake a similar project in the wilds of Africa. In addition to being a good photographer, he must be a man of courage and have more than a smattering of knowledge about native animals, their habits, and what it takes to get them before a camera lens. Such a cameraman is Miki Carter who is rated one of the most successful cinematographers

of wild life on the dark continent.

Carter recently completed a filming assignment in Africa for Sol Lesser Productions, for whom he shot all the location footage for the soon-to-be released color production, "Tarzan's Fight For Life." Of the total footage in the production, approximately 3,000 feet is said to be the product of Carter's camera work.

White hunters who have accompanied Carter on his filming safari say he is

marked for death in Africa, because of his daring in photographing wild animals at close range. Because he prefers to shoot with short-focus lenses, he often works dangerously close to his subjects.

"I don't like telephoto lenses for making shots of wild animals especially if they are supposed to look dangerous and realistic," he says. "A lion, for example, may be in sharp focus with a telephoto, but then objects in front and behind him are fuzzy, destroying the very men-

acting effect we attempt to capture. I may even use a wide-angle lens for such shots at times. Our aim is to produce such an illusion of realism the audience will feel it is actually at the scene of action."

One shot of a lion, which is to be seen in the new Tarzan thriller, makes the animal appear but an arm's length away from the camera. The script called for the big cat to run toward the camera, then jump over it. For this it was necessary for Carter and his crew to trick the animal into the desired performance. They dug a pit for the camera and covered it with their bushes to conceal it along with the cameraman. A dead zebra was then placed immediately back of the pit—a tasty tid-bit for the lion.

With his Arriflex camera set up in the pit, Carter waited patiently two days for the lion to respond to the bait. Finally the big cat prepared to move toward the carcass. When he was about a hundred feet distant, Carter started the camera. With a 17mm lens, he kept the beast in sharp focus throughout the shot as it approached, filled the frame in a big closeup, then leaped over the pit. Later, the animal obligingly repeated the performance for a second take. For these shots, the though-the-less finder of the Arriflex was of great assistance, enabling Carter to keep the animal centered in the frame throughout the shot.

While Carter uses a Mitchell camera for most of his location work and at ways for shooting background plates, which are an important part of location shooting in productions of this kind, for rough-and-tumble situations, such as the one just described, he prefers the more compact and portable Arriflex 35. Be-



**WHEN THE** busy and quickly-reprieved camera team suddenly collapsed, cameraman Carter and his Arriflex were dumped into the shallow pit, spelling a much-wanted shot for "Tarzan's Fight For Life," produced by Hal Rosson.

cause producers are demanding more and more realism in their pictures, actors taking part in films such as this Tarzan production, more and more are expected to appear in scenes along with wild and sometimes dangerous animals. They are no longer satisfied with producing an illusion of such action with the aid of background plates and puppets.

Thus on such far-away locations as

Africa, cinematographer Carter invariably must set up the shot, direct the actors, and try to get the animals to cooperate as it was dreamed up by the script writers.

On one occasion, Carter and his white hunter struggled for two days to photograph a stampede of wildebeests and zebras—a scene in which Gordon Scott, playing Tarzan, had also to ap-

(Continued on Page 379)



**CARTER IS NOTED** for unusual realism of shots of dangerous animals—result of shooting at close range, using regular and wide-angle lenses.



**MRS. CARTER**, who accompanies husband on filming expeditions as script clerk, watches Carter photograph a herd of young elephants at a watering hole.

# ECONOMY AND SPEED WITH SINGLE-DOUBLE-SYSTEM SOUND

By GEORGE J. YARBROUGH

A DISADVANTAGE often encountered in shooting sound films with a single-system camera is the problem of editing which occurs because both picture and sound are recorded simultaneously on one film—but with the sound advanced several frames beyond its respective picture frame. Thus, when cutting for picture, smooth sound continuity results, while cutting for sound results in unsmooth picture continuity.

In order to produce economical TV commercials in a minimum of time geared to the budgets of local sponsors, I sought a solution to this problem. The "pre-record" system employed by major studios in producing musical films seemed to offer a solution. I saw that by adopting this system, I could first record the sound (test of the commercial) on tape, then photograph the narrator as he again spoke the words carefully synchronized in a playback of the original tape recording. The pre-recorded sound, of course, now would be re-recorded on the film along with the picture. By shooting strictly according to a prepared script, the camera position could be altered for CUs, MSs, etc., without involving the single-system sound cutting problem, because each take would be shot and recorded as a unit, with the camera "running over" at the beginning and end to provide the necessary flexibility in cutting.

I decided to make a mockup of this format. I wrote a simple 15-second scenario involving a disk jockey at work and photographed and recorded it with an Arriflex Cine Voice camera. Briefly it shows the DJ opening the program after playing the theme, which had the title and credits superimposed over a shot of the record revolving on a turntable. The record is introduced, then played. The script follows.

Scene	Splice	Description
1		MCU—record on turntable starting to revolve. Superimpose title and production credits. Record is heard on sound track.
2	1	MS—DJ is seated at turntable. Credit is superimposed. (See Fig. 1). Music and superimposed credits fade out together, as DJ starts to give a rundown of the records to be played on program.
3	2	CU of covers of the record albums being described.
4	3	MS (Same angle as in Scene 2) (Splice shown in Fig. 2). Next record

FIG. 2—Typical splice in uncompleted scene which was later "misused." As in this instance, all splices are made on the frame line.



FIG. 1—Opening scene in author's test film, which demonstrates method of single-double-system sound achieved with single-system sound camera and tape recorder.



is introduced.

- 5 4 MS (Change angle)... description of record continued.
- 6 5 CU — New record on turntable. At cut, DJ announces title of record; turntable starts to revolve and music is heard.
- 7 6 ECU — of pickup arm and revolving record as music continues.

As may be seen, this test comprised seven different scenes. The only cut obvious in the sound track occurs at splice No. 3 (Fig. 2), which was made in an unobscured area of the track and later minimized by blotting Splices 1 and 6 were made in the recorded music area of the track, while splices 2, 4, and 5 (Figs. 4 and 5) were made in the narration areas. These splices were slightly audible as such due to the overlap of 1/10" which occurs where the films are joined together. (The noise is caused by the different density of the splice overlap, compared to the normal base density of the separate pieces.)

To fully utilize all the potentials of the system, careful planning and writing of the script was essential. In the test described here, a rough draft of the script was made and the music and speech recorded in the same order they were to appear in the finished film. (This procedure is not absolutely necessary but was used for convenience and

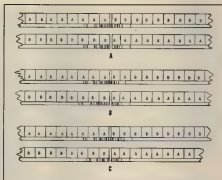


FIG. 2—Showing ideal matching of track with respect to picture A, shift of track, incorrect splicing, B, and shift of sound track with respect to picture A, correctly spliced, C.

simple bookkeeping, since I had no assistance in preparing the test.) Logging was necessary as a guide to shooting and superimposing the titles, as I chose to change scenes behind the title.

The theory behind the cutting procedure is quite simple. As already stat-

ed, the entire sound was pre-recorded in the proper sequence without interruption on quarter-inch magnetic tape. Scene 1 was set up. Output of the tape recorder was fed into the input of the Amtron recording amplifier. With the

(Continued on Page 100)

FIG. 4—Splices related scenes leaving same sound track. The splice could have been made at any point within the two matching pictures of the film.



FIG. 5—Splices as in Fig. 4 but with the films reversed in position so the sound tracks occupy corresponding areas of tracks on the spliced film to show relative track positions of each scene.





**TYPICAL BOOM SHOT**, as filmed on Hollywood sound stages, is this scene photographed by Joseph Rotenberg, A.S.C. for MGM's "Greta". Camera pulls back progressively as players dressed long stately in garden, maintaining a uniform distance from players all the way.



**SHARP AMATEURS** have adopted the moving camera technique, too. Here Jackson Coates, with his 16mm Bolex ingeniously mounted on swiveling platform atop a child's express wagon, instructs his dollie-handler Janet Chapman before starting a "pull-back" shot.

## Dramatic Emphasis With The Mobile Camera

Putting the camera on wheels can enhance the photography of any film, be it a Hollywood feature, an industrial, or an ambitious amateur production.

By HERB A. LIGHTMAN

**F**EW, IF ANY, motion picture scripts are written today that do not call for dolly, crane or other mobile camera shots. The "Baud" camera has become a dominant part of contemporary cinematographic technique, and the best Hollywood scripts are written so that as much of the story as possible can be filmed in long, continuous takes.

Two things are achieved when lengthy action is filmed in a continuous take. Instead of several different camera set-ups. First, the mobile camera shot is less costly in production time, and the story is greatly enhanced where important action plays continuously without interruption.

A sound psychology underlies the use of the mobile camera. Movement purely for the sake of movement is an abuse of an otherwise powerful technique. The intelligent director or cinematographer moves the camera only when the demands of the film situation merit. Note that movement. Correctly used, the mobile camera produces a

(Continued on Page 352)



**COSTLY EQUIPMENT** isn't always necessary for making effective moving camera shots. Here a simple "home-made" 4-wheel dolly gives mobility to the camera filming a 16mm industrial motion picture.



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UNDERWATER shots for "The Enemy Below" were filmed in the Mediterranean and also in a tank at a London studio.



FOR SCENES like this, both Otto Heller and Egl Wesholt used an Aeriflex camera in a water-tight blimp.

## 'Be Quick, And Be Sure!'

"That's what keeps you working," says British cinematographer Otto Heller in discussing his recent photographic assignments.

By DEREK HILL

"I'VE NO LIGHTING, it's the artists I make right first," said Otto Heller, B.S.C. "Then everybody again engages you. The set don't talk to no-one."

In Brian Heller's reputation as a director of photography is matched only by his reputation for relentless battles with the intricacies of the English language, from which he always emerges triumphant.

Technicians still talk affectionately of his greeting to Vivien Leigh: "Hello, Lady Larry darling, how is Sir this morning?" And his summary of *Viva*, Visconti in response to a question from the late Sir Alexander Korda, planning to use the system for "Richard III," is equally celebrated: "The main thing is the scratches go acrosswards instead of downwards."

The measured grammar, the Czech accent and the unpredictable directions of his conversation make an interview with Otto Heller a curious experience. I thought we had planned to talk about

his work on "The Silent Enemy," the new Remake production on the wartime exploits of Commander Crabbe, the frogman, but as often as I tried to get back to it, he fractured a fresh idiom, and busily broke away at the most unlikely tangent.

But I did learn that the toughest problem on William Fairchild's latest film, which stars Laurence Harvey and Dawn Addams, was the intricacy of lighting. The production was on location six weeks at Gibraltar and four at Malta and took another five weeks' studio work at Shepperton studios, outside London.

"Trying to get the effect of 8,000 foot candles of Mediterranean sun in a studio with 2,000 foot candles of light was no joke," he told me. (The translation into more logical English is more through, out.) "And the underwater sequences were particularly tricky."

Egl Wesholt shot the principal underwater scenes in the Mediterranean, and Heller was responsible for all tank

clousings and above-surface shots. "Some of the underwater stuff is more, too," he said. "In fact the underwater footage has been so well edited by Alan Odinson, who cut another recent film I worked on, "Manafra"—that it's difficult to say where Wesholt's work ends and mine begins."

The flow of the film, which Heller by no means exaggerates, is also a tribute to his control of lighting continuity in the studio tank closer shots.

"The location material was shot in a lagoon about ten miles from Malta," he told me. "We only had the sun, of course; we couldn't take lamps out there. We were using navy lanterns as domes. For most underwater shots the camera operator doesn't really have to swim—he more or less stands on the bottom. We used an Aeriflex fitted with a special blimp. The blimp alone cost about £1,000 (nearly \$3,000).

"You know what happens with a film with dogs and children? Nobody talks about anything else. Well, this time it's happening to me, except that everyone talks only about the underwater scenes. Yet there were plenty of problems above the surface. That long sequence at night, for instance, with the mines going off all around. They were real naval mines, not dummies; and they threw one boat about and filled the air with fish. All the local boys came rushing out to fill their boats."

Laurence Harvey, he added, is a cameraman's actor. "He makes valuable suggestions during shooting, and he knows what your trying to do. Watching rushes, too, he's really on top of what's going on."

Director William Fairchild left Heller to his own ingenuity for much of the "Silent Enemy." "He's a director who concerns himself with the action and the players," commented Heller, "and they're often the best. Sometimes the directors who are technicians at heart don't seem to get life into their films. I think there are only two in Britain who combine this sort of technical know-how with complete control over the story and acting side—David Lean and Carol Reed."

Heller finds shooting in black-and-white much more of a challenge than color. "Working in monochrome you have to put your own shading in," he said. "Color separates itself. Given a good director, and assuming that you've got a certain amount of basic color filming is much easier than monochrome work."

"There are a few films that need atmospheric color, of course—like 'The Ladykillers' and 'Richard III,' which both gave me some headaches, but they're unusual. But I think 'The Duke Was Jealous' should have been in color."

We had just come from the trade show of this British musical, Anglo-American's latest vehicle for Tommy Steele, a Cockney version of Elvis Presley. "In fact it was shot in six weeks, regardless of the weather. A lot of the exterior, supposed to be in sunny South America, were shot in pouring rain. . . . And Tommy is a difficult boy to light. The only time his mouth is closed is when he's talking."

Tommy Steele plays two parts in "The Duke Was Jealous," and in one sequence sings and dances with himself "Straight-forward split-screen work," explained Heller, "except that where I always prefer to cover one side, wind back, cover the other side, and re-shoot on the same negative, our schedule was so tight that

(Continued on Page 357)



SPLIT-SCREEN shot made by Otto Heller in the camera for "The Duke Was Jealous," starring Tommy Steele. Here Steele appears at extreme left, side of desk.

## The Way Light Is Measured

THE terms "candle," "candlepower," "lumen," "foot candle," and "foot-lambert" are conventionally employed as units of measurement of light.

The candle is the fundamental unit of light intensity and is a measure of the ability of source to radiate light. A source is said to have an intensity of one candle if it is capable of illuminating an object at a given distance to the same degree as would a standard candle. The standard candle was originally defined in terms of the open flame of a  $\frac{1}{2}$  gram candle burning at a specified rate.

Later, a group of carbon filament lamps were preserved at the National Bureau of Standards. In 1948 these were replaced by a very accurate method based on the solidifying temperature of molten platinum.

Candlepower is the light intensity of a source, expressed in "candles." Thus, it is proper to state that a particular carbon arc, for example, has a "candlepower" of 10,000 candles. Partially with carbon arcs, which radiate light in one hemisphere ahead of the center, the light intensity (or candlepower) varies with the direction of view. It is therefore common to further specify the candlepower with respect to the direction, such as "horizontal candlepower," "axial candlepower," "forward candlepower," etc. Candlepower values can be specified for any direction or angle from which the light source is viewed. Candlepower is the measure of the light-emitting power of a source with regard to its area.

Brightness is the measure of the light-emitting power of a source in relation to its area. It is expressed in "candles per unit area." Obviously two sources can be of the same candlepower while differing in size. The smaller of the two is then said to be "brighter." The square millimeter (0.00155 sq. in.) has been chosen as the unit area for expressing the brightness values of the carbon arcs described here. Candlepower (total light-emitting power of a source) and brightness (light-emitting power per unit of area), when measured in all directions, together comprise complete specification of a light source.

A lumen is the measure of the rate at which light pulses are emitted or received. A lumen is the rate at which light is emitted from a source of one candlepower to an area of one square

foot, so located that all points of the area are one foot from the source. If a source of one candlepower in all directions is enclosed at the center of a sphere of one foot radius, each square foot area of the sphere will receive light pulses at the rate of one lumen.

(Continued on Page 361)



"CANDLEPOWER" is the light intensity of a source.



A "LUMEN" is the rate at which light is radiated.



"FOOT CANDLE" is the rate at which light pulses fall on a surface.

## SHOOTING "THE LINEUP"

(Continued from Page 362)

When shooting operations were moved into the Zoo proper, clouds appeared to constantly vary the light. Muscarello met the challenge by standing behind the Mitchell camera and working the variable shutter control with one hand and checking his light meter held in the other in order to compensate exposure for the varying light.

For most exterior shots for "The Lineup," Muscarello uses umbrella reflectors for fill light. On extremely overcast days he employs spots or brutes for fill light, but only as a last resort. Too often such lighting appears unnatural, after which carefully balanced, he points out. Usually, he relies on a switch from Plus-X to Tri-X film whenever adverse lighting conditions are suddenly encountered.

"Meeting the schedule" is the all important consideration of the company when shooting on location, which accounts for the company pressing forward when shooting even when bad weather prevails. By the same token, looked for interference is never allowed to slow the company or halt shooting activities. Once, when it was shooting along the Harborview, a pile driver began booming in the background. The offending machine was quickly written into the script and the sound made to figure

prominently in the background for atmospheric effect. To introduce the new factor visually, Muscarello had his camera moved to the scene of the pile-driving and made a couple of establishing shots. On another day, while the company was shooting exteriors in a street, a fire engine with siren screaming sped across the scene in the background. Instead of writing off the shot as "spoiled," it was marked an OK take, and cut into the picture. The fire engine lent an unusual effect of realism both visually and in the sound track.

Because TV films are invariably produced on extremely tight budgets, process shots—which are costly—are invariably avoided, and this is no exception with the "Lineup" series. This places something of a burden on the resourcefulness of the cameraman, but a cinematographer like Muscarello invariably is equal to the challenge.

A recent case was a complicated chase scene, which would have been a cinch—but more costly—in produce on the second stage with background projection. Muscarello completed it in a single take on the first try. The problem was to show streets Warner Anderson and Tom Tully inside a police car so it chased a handoff driving a speedy MG. Muscarello had the

trunk door and the rear window of the police car removed, then secured the tripod-mounted camera to the floor of the trunk so it could cover Anderson's and Tully's action, as well as that of the fleeing MG, through the rear window.

More than once Muscarello's compositional ideas have influenced the staging of exteriors for "The Lineup." One result is that he seldom shoots closeups on location in the Bay City "San Francisco" is the framework for the stories he films here and therefore it should figure prominently in the photography along with the players," he says. As a result action that otherwise might be shot in closeup is made in a medium or two-shot, with some prominent San Francisco landmark or architectural feature subtly included in the scenes. "When closeups are essential," he continued, "they are made later at the studio."

Because the pressure of tight shooting schedules keeps the company confined only on the move when shooting on location, Muscarello has learned to get along without the benefit of "dollies" or "cranes," which are standard practice in Hollywood studio production. "By the time rushes reached us from the lab," Muscarello says, "we would already be shooting scenes on a new script. Our work has to be right the first time, because there is little or no allowance made for retakes," he added. However, duly

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lab reports are received and checked carefully, and these constitute a satisfactory guide to the photographic results being achieved.

Mosquera's high-speed, time-saving filming technique is the result of his early association with the FBO (later RKO) Studio, where he filmed nine-day western "quickies." An uncanny shiffler he developed there to make the right

decision in a hurry made him a "natural" for photographing television films on location.

Considering the success he has had with the "Lineup" series, it would seem that San Francisco is a point of destiny for Mosquera; it was here, years earlier, that he photographed much of "I Remember Mama," the achievement that brought him his first Academy Award.

## ASSIGNMENT IN AFRICA

(Continued from Page 371)

pear. Carter and his men set out to locate a suitable herd of animals and more important, to determine in which direction they were headed in their migration. With this accomplished, they had a number of motor trucks placed in the animals' path in order to concentrate their movement through a narrow valley for better pictorial effect. To photograph this action, the camera was set up within a strong cage which had been erected in a shallow excavation and fortified with heavy timbers.

Carter still bears scars to remind him of a dangerous encounter with a hyena. In an earlier assignment, he was lunge a camera cage, barely escaping a fight between two hyenas. Suddenly, and without warning, one of them spotted Carter and thrust its head menacingly

through the cage framework. The startled cameraman hopped the beast on the head with his bare fist. As he drew back his hand, the angry hyena clamped its teeth on his wrist.

Elephants, said Carter, are the most dangerous of all wild animals to film. Last year, while he was filming a large herd, a ferocious bull elephant caught the human scent and charged the camera truck, with the herd following behind him. The startled animal tried to yank Carter from his position at the rear of the truck. His life was saved when the bull, in a renewed fit of rage, suddenly dashed off to uproot a tree to throw at the intruding vehicle and its occupants. In the meantime the driver quickly got the truck to the nearest road, and sped to safety.

Such experiences, of course, are all in a day's work for the photographer shooting in the wilds of Africa. On another occasion, while shooting a sequence of scenes on the Congo river, Carter had another freak experience that almost proved his undoing. To get realistic shots of Congo rapids, he perched on the end of a flimsy, improvised boom which had been extended out over the treacherous waters. Suddenly the boom twisted and spilled Carter and his camera into the turbulent Congo. He never let go of his camera, and the two were soon pulled to safety.

Among the innovations and techniques which Carter employs to spend his work in location filming, is the use of a compact, portable tape recorder, which he uses to record verbal notes of important technical data concerning the shots he makes. These records include such data as to the time of day a specific shot was made, the condition of the prevailing weather and light, and the exposure used. Transcribed, such data proves invaluable when on a later date he reconstructs a similar photographic situation.

He has also built a valuable mental scorebook of information on the wild animals of Africa. He knows that the best place to photograph elephants is in Voi, Kenya. And the most likely spot to

(Continued on Page 382)

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**ASSIGNMENT IN AFRICA**

(Continued from Page 379)

find lions in the Serengeti plain. Black rhinos, he says, invariably can be located in great numbers near Kilimanjaro, while the white variety may be seen in South Africa or along the northern frontier. With such a storehouse of knowledge, he can avoid the less lively locations and make better use of his time.

One of the biggest headaches encountered in filming in Africa is dust. When Carter and his crew are on the move, all cameras and equipment are packed in plastic bags; but even with this precaution, it is necessary to carefully clean each piece of equipment daily in order to keep it in top working order.

Wildlife, of course, is highly important to the success of Carter's filming assignments. Where possible, he likes to work close to the rivers for two reasons: wildlife is more plentiful, and river navigation is simpler than traveling on land. For this, Carter recently had constructed for his special needs a lightweight aluminum outboard boat—a combination sea-tied and catamaran driven by two 25 hp outboard motors. Mounted in the bow is a sturdy column that takes the Arriflex camera and tripod head. The track, used for all overhead travel, is virtually a studio on wheels. Besides compartments for the various cameras and related equipment, provision has been made for an Anapex time recorder and the necessary batteries for driving same.

In addition to his many assignments for the Turner pictures during the past five years, Carter has also shot location footage in Africa for five other TV film series, including "Bold Journey," "Search For Adventure" and "Serengeti, Queen of the Jungle." A new television series based on the Turner adventures is scheduled for release next fall. For this, Carter has shot more than 500,000 feet of film.

Carter's career as a cinematographer began in 1936 when he went to Singapore in search of a native fruit he planned to use in a new type dog food he hoped to market. During his travels through Malaya, he started shooting movies as a hobby. He found the fruit for which he was searching, but the Japanese cut short his work when they invaded southeast Asia. He escaped in a junk to Sumatra, from where he moved on to Java, then British North Borneo. Sometime later he undertook cinematography in earnest, traveling through the Peruvian Andes, the Mato Grosso of Brazil and in Uruguay, Argentina and Chile. In 1949 he made his last safari in Africa, and since that

time he has made films from one end of the continent to the other.

Like the famed husband-wife team, Martin and Osa Johnson, Carter and his wife, Peggy, work together on Carter's jungle photographic jaunts; she keeps notes and makes production stills—some of which have been used for background projection photos.

An amateur of Carter's is to photograph one of the strangest jungle dramas he has ever witnessed—the tripping and killing of an elephant by an army of ferocious African safari ants.

"I have already filmed some of it," he says, "and someday soon I hope to finish it. One often waits for years for just the scenes he wants, then suddenly you have it on film. That's how unpredictable things are in the wilds of Africa."

**THE MOBILE CAMERA**

(Continued from Page 374)

fluid continuity—a smoothly flowing interplay of changing compositions with the individual scene. These compositions change and vary from extreme long shots to extreme closeups without the harshness of a direct cut. Thus the audience's attention is held without the mechanical interruption to the subject matter of the scene.

There are several types of camera movement, and each has come to be known by a specific name. The follow shot is one of the most common and, as the name implies, it is used to follow the action of one or more characters within the scene. Usually this is accomplished by a simple tilt or pan or a combination of the two. Frequently, however, it becomes necessary for the camera to follow a player over a wide stretch of terrain. When this is the case, the camera is mounted on a dolly, a camera cart, or a camera boom and we have what is known as a tracking shot in which the camera actually follows right along with the subject in his course of action.

In this type of shot the camera's movement for movement is usually pretty well established, since it depends upon and is keyed to the movement of one of the players. The effort to be desired, as in all types of camera movement, is smoothness—since an erratic pattern of movement would detract from the scene more than it would add. If the camera glides smoothly along, the audience will rarely be conscious of the movement.

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in the pull-back, in which the scene opens with a closing, the camera later pulling back to present a much wider angle of the scene. This device is used where it is first necessary to focus the audience's attention on a certain small detail of the scene, later broadening the angle to show the context in which that detail is mounted.

In the memorable "The Lost Weekend," photographed by John Seitz, ASC, there was one outstanding scene of this type that opened with a striking super-closup of the main character's eye as it fluttered open, bloodshot and bleary, the eye of a drunkard. The camera then pulled back progressively to a medium long shot of the character as he awakened from his stupor and began to stumble about the room. In this shot, the closup of the eye was the keynote of the scene. It set the psychological mood; it focused the audience's attention by filling the screen with a small but vital detail of the character's state of being. The initial impression created by that closup carried over to the remainder of the scene and influenced the audience's reception of what followed.

This type of shot is sometimes done in reverse. The camera first records the action in a long shot and then is pushed in to a close shot of a particularly significant of the action. This type camera

movement is widely used and has the effect of first orienting the audience as to locale, action, and period, before moving in to treat dramatically a smaller part of the overall scene or the principal action performed within it.

A variation of this technique is the camera zoom shot, in which, for dramatic effect, the camera first shows a relatively wide view of the scene, then rapidly zooms in to a closup of some specific detail. The zoom shot, when correctly used, is a dynamic way to focus audience attention on a dramatically important facet of the scene or action.

Except in a travelogue, it is not considered effective technique to pan a static object—although many filmmakers have done so in an effort to force action into an otherwise dead scene. At best this is a forced technique and should be avoided except where intended for special effect. More movement of the camera can never compensate for a lack of action within the scene.

Occasionally in a photoplay, the camera—in its role of all-seeing eye—becomes a wandering reporter, hovering here and there to pick up bits of action and characterization, then moving on to select other facets of the situation, the sum total of which adds up to the creation of considerable atmosphere. A notable example of this technique was used

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in the memorable film, "Casablanca," photographed by Arthur Edson, ASC. In the sequence establishing the interior of "Rick's Cafe Americain" (toward the end of the story), the camera moved its way through the crowds, stopping at various tables just long enough to record scraps of color and atmosphere, then traveled on. It moved exactly as a casual observer might if he were threading his way through the maze of tables, catching a glimpse of this person or that and overhearing an occasional sliver of conversation. The effect in the film was to set the unusual mood of this exotic locale, to identify the types and characters involved in the story, and to prepare the audience for the action that was to follow.

In studio parlance, whenever the camera moves and comes to rest on a new composition, the maneuver is known as a camera stop. Certain scenes, especially in musical extravaganzas, involve a great many camera stops. In fact, when this type of film was approaching popularity certain directors and cameramen (as a matter of professional achievement) used to vie with one another to see how many camera stops they could get into one continuous scene. Actually, when well done, this is more effective than where a series of cuts are made in photographing a musical number. But when camera movement becomes an end in itself, the result is bound to be clumsy and without meaning.

One otherwise competent director of musicals and light comedies used to insist that the camera be moving in every scene. He would have the camera panning in, panning back, zooming down from the sky or up from the ground, whether the scene required camera movement or not. In one of his productions—a film containing well over 300 scenes—there was only one static shot. Audiences left the theatre after viewing this film complaining of headaches, from being

"whirled around so much."

At the other extreme was an equally competent director of dramatic themes who insisted that the camera should never be moved. His compositions on the screen were particularly forceful and artistic, but he was reluctant to move the camera for fear his carefully planned compositions would be destroyed. As a result, action within the frame was stilted, inhibited, held back. One could almost sense his pained watching for the chalk marks on the set floor so they would not step outside the bounds of the static frame. In one drama that this same man directed—a film crisscrossed full of artistic and static compositions—there was only one short follow shot. The result on the screen was a static drama.

Obviously intelligent camera movement is the result of close, careful pre-planning between the director and cameraman. The director, in his interpretation of the author's screenplay, plans his action and consults with the cinematographer as to how that action can most effectively be portrayed on the screen. Often related action set down in the script in well-defined separate scenes can be embodied in one all-embracing scene and connected by well-motivated camera movement. The resulting scene (which otherwise would have been staged as a series of short, choppy scenes) becomes a fluid continuity of changing compositions that move smoothly, one into the other.

The fluid camera is a device that belongs particularly to the dramatic film. It has the quality of action that is essential if motion pictures are to be truly "moving" pictures. Skillfully used, camera movement gives the motion picture unlimited scope to select and present on the screen the various elements of the story in dramatic and forceful relationship to one another.

**SINGLE-DOUBLE-SYSTEM SOUND**

(Continued from Page 27)

exposure lamp and gain controls set at the proper levels, both tape recorder and camera were started simultaneously. It was only necessary to let the camera run for the length of the desired scene plus the runover at the beginning and end of the take.

The camera was then moved for scene 2—a medium shot. The sound tape was backed up several feet on the playback-recorder so that the next scene would begin on a portion of the previous scene's sound track as an aid to matching and cutting. (i.e., scene 2 would begin with action and sound correspond-

ing to that of the last foot or two of the preceding scene, thus providing the key synchronizing point in the sound track to permit the smooth cutting this system is designed for.)

(For those who would attempt this system, it should be pointed out here that extreme care should be taken not to alter the sound level of either the camera or recorder or to change the lamp settings of the galvanometer, also, to carefully mark and log these settings so that they can be restored to the proper point in case they are accidentally moved, as might happen when shooting

is extended over a long period of time. Where these precautions are not taken, there is possibility that a film shot and recorded at one time will not match in sound level that shot at a later date.)

After scene 2 was completed, the tape recorder and camera were stopped and the camera moved to the next set-up. The tape was again backed up, and shooting began as in the preceding scene.

Fig. 3 is a diagram illustrating the ideal, the incorrect and the preferred splice in this system. The ideal splice is shown at A. The edited and spliced film is shown at the top, with no break in the sound continuity. The reason of re-matching sections of film are immediately below; the missing portion represents the splice overlap. As may be seen, scene "A" continues from the left and is joined to "B". Note that once the match is made between the sound tracks of films "A" and "B", the splice then can be made at any point—which allows greater flexibility in the picture cut. Here may be seen the reason for allowing the camera to run a little longer than the established scene length, i.e., starting ahead of the scene (accompanied by a portion of the previous sound track) and running over a foot or so at the end.

The splice illustrated at B in Fig. 3 shows what generally happens when the

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## BE QUICK, BE SURE!

(Continued from Page 376)

I had to shoot each ball on different stock, which was then printed together by the lab. It's a pity, because it meant three dopes—one of each side and one of the combination, with resultant grain increase."

Heller described his usual approach to a fresh set. "Sometimes, if the art director's done a good job, it's all obvious at once," he said. "You come on the set and you know immediately where you want to put your lights."

"But then there are the times when you step on your tracks when you see what they've put in front of you. Personally I always start with a single lamp in the middle of the set at times like this. Then I swing it round the whole set, and find the best direction for the shadows. Once I've got that settled, I can start adding to it, as economically as possible."

"I don't think one cameraman can learn from another. I never worry if another lighting man walks on to my set; he can't tell what I'm trying to do. And it's the same if I go on to someone else's set."

"Look at that wine glass. See the bright spot it throws onto that plate? The rules would say 'Get rid of it.' But I'd leave it there. Anyway, how can you talk about lighting? You just do. I'm no Picasso—but it's like trying to make an artist talk about his painting."

Otto Heller is now enroute to Spain for location filming on Fox's "Sheriff of Fractured Jaw," starring Kenneth Moore and Jayne Mansfield, directed by Raoul Walsh. After that, he may direct lighting for the theatre for the first time for Laurence Harvey, who is producing an all-Negro show in London.

"There are only two principles you must follow in the business today," Heller told me as we shook hands. "Be quick and be sure. That's what they want. And that's what keeps you working."



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## THEATRE SCREEN BEST TEXTBOOK

(Continued from Page 367)

through a side door or window in the distance. This has the effect of imparting depth and three-dimensional aspect to the scene.

An important set-lighting technique which may be seen in the interiors of almost every feature film, is the method of subdividing the lighting on large wall areas or breaking it up with projected shadow patterns by means of such accessories as the candelabra ("cookie"), venetian blind, etc. Gobos and barn doors are also effectively used to subdivide or cut off light in unwanted areas. The advent of this technique introduced medium and low-key lighting in motion pictures. Today one rarely sees a large room in which all walls and the ceiling (where it is visible) are uniformly lit in high key. Instead, the light will be

brightest on the lower half of the walls, and gradually recede in intensity toward the ceiling. Another method is to soften the wall lighting by projecting a subtle, almost imperceptible shadow pattern upon it, or a portion of it, by means of a "cookie" mounted before the lamp that illuminates it. So important is this practice in set lighting today it has become every student of cinematography to study its effect on the screen when attending the theatre.

Thus far we have dealt only with some of the professional's set lighting techniques. In a future article, we will deal with his "camera mechanics"—the contemporary methods employed with camera, dolly, and boom to smooth the flow of continuity or point up some dramatic moment in the picture. ■

## ADDING TITLES TO PROCESSED FILMS

(Continued from Page 365)

by acid and alkali. The stability of the coating is excellent and, if desired, coatings can be made several days or weeks before exposure. The sensitivity is unaffected by atmospheric changes. The coatings can be handled under moderate yellow tungsten or gold fluorescent illumination for as long as 30 min without danger of fog. White fluorescent illumination should not be used however, because fog can result under these conditions for exposure times as short as 6 sec.

The coating is sensitive to ultraviolet radiation and for this reason the exposure is normally made using a carbon-arc lamp. Areas which are exposed to ultraviolet radiation become selectively hardened. The unexposed areas are removed by a developer containing organic solvents.

Certain precautions should be observed in handling KPR and KPR Developer. Adequate room ventilation should be provided to avoid any irritation from solvent vapor during the spraying and drying operations. KPR Developer is flammable and should not be used near open flames or sparks. Local exhaust may be needed in the vicinity of the developer tanks or trays and during the application of KPR.

The artwork for the titles or other images to be superimposed on the picture background is prepared in the usual way using conventional media, such as letterpress or offset printed copy, ink lettered cards, plastic letters, Foilotype,

etc. Experience will determine how much fine detail can be included in the artwork for the particular application and the extent of reduction. During the treatment of the film in the oxidizing bath, some spreading of the image does occur. On this account, certain type faces having fine serifs may not reproduce satisfactorily. Generally speaking, block-type letters and hand-lettering without extremely fine detail are preferable.

The artwork is photographed on a high contrast material, such as Eastman Fine Grain Release Positive Film, Type 5302. The film is processed in a normal positive-type developer, such as Kodak D-16 Developer, to yield a high-contrast negative. The latter is then printed onto the same material and processed in Kodak D-16 Developer to give a positive with dense black letters and clear surround.

(Examples of superimposed titles on Kodachrome and Ektachrome Films and Eastman Color Print Film, Type 5302, were prepared in the form of 2 by 2-in. slides for the oral presentation of this paper. For three of these slides the titles were reduced so as to be included in the frame area of 24 by 36mm normally used for 2 by 2-in. slides. A fourth slide, made on Eastman Color Print Film, was prepared to simulate the reduction conditions used when making titles for slideshows. In this case, the frame area in which the title is included was the same as that of a stand-



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and Kern sound motion-picture release print, i.e., 0.600 by 0.825-in. Figure 1 shows the results obtained on Eastman Color Print Film.)

The procedure used for making these illustrations is described in detail below. Suggested process modifications are given for application of the method to larger scale production, as for large groups of transparencies, slides and motion-picture release prints.

**Coating:** The color film (Kodachrome, Ektachrome or Eastman color Print Film) was spray-coated\*\* with a mixture of equal volumes of KPR and tolensett† and allowed to dry in a ventilated hood. Coating was carried out under moderate yellow tungsten illumination.

**Exposure:** The coated film was placed in a printing frame in contact with the title positive and exposed to a 30-amp arc lamp at a distance of 3 ft. for 2 min. The exposure time is not critical for this type of line reproduction; 1 min., as adequate and 4 min., as not excessive under the same conditions.

**Development:** The print image was developed in solutions containing organic solvents in order to remove the unhardened areas which were beneath the title positive letters and consequently had received no exposure. Development was carried out at room temperature (70° to 75° F.). Because of



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differences in the support characteristics of the separate films, two different solutions were used.

**Kodachrome and Ektachrome Films**—15 to 30 sec. in trichloroethylene.

**Eastman Color Print Film**—2 min. in Kodak Photo Resist Developer.

**Washing and Drying:** In order to remove any residual unexposed KPR, the resist image was then washed with tap water for 30 to 60 sec. and excess water droplets were removed by blotting with a towel. The film was then completely dried in forced warm air at 100° to 150° F.

**Etching:** To destroy the emulsion in the areas occupied by the title letter images, the film was treated in a 0.5% solution of sodium hypochlorite for about one min. at normal room temperature. This is a rather critical step and it must be timed accurately since insufficient treatment in the solution will result in incomplete destruction of the areas to be removed and over-treatment will cause undercutting and speeding of the image. The above concentration of hypochlorite appears to offer satisfactory control for this hand operation but other concentrations might conceivably be used for continuous operation.

The 0.5% sodium hypochlorite solution can be prepared conveniently by dilution of one volume of an ordinary household bleach, such as Clorox (5.25% hypochlorite) with nine volumes of water.

The film was washed again for a few seconds in tap water to remove the bleach solution and dried with the aid of towels and warm forced air.

**Removal of Resist:** The final step in the removal of the resist image from the background picture area which is carried out by gentle scrubbing of the entire surface with cotton moistened with trichloroethylene. As noted above, certain precautions should be taken with this toxic material.

The foregoing procedure is quite satisfactory for use with individual transparencies. Certain modifications should be made, however, if large groups of slides are to be prepared or where it is desired to use the method for making titles on slidefilms or motion-picture release prints. No actual large-scale production has been done in this connection but some suggestions can be offered which should be helpful for such work.

Large groups of individual transparencies can be sub-mounted and spray-coated at one time, thus minimizing waste of the KPR material. Processing can be carried out in deep tanks using suitable processing racks.

For slidefilms and motion-picture release prints it would appear quite desirable to use hand- or work-type applica-

tors for applying KPR by continuous means, provided that some arrangement is made for rapid drying of the coating to minimize film curl.

Exposure of the coated film can be reduced considerably by using arc sources of higher intensity, by suitable reflectors and by shortening the distance from source to exposure plane. For example, in a motion picture printer, it should be possible to utilize a reflector-type arc lampsource, such as is used for a theater projector, by concentrating the light flux on the printer gate. The exposure time could probably be reduced to the order of one second or less. Mercury vapor and xenon flashlamps might also be considered as alternative light sources.

The chemical processing steps could be carried out by continuous machine to provide the appropriate treatment at each stage. Development could be carried out by deep tank using a machine speed and proper path length for the required time. As an aid in drying of the film after the washing operations, efficient air squeezers, followed by impingement-type dryers, should be used. The etching operation could be done by simple immersion treatment with appropriate adjustments in the hypochlorite concentration. Finally, the removal of the resist could be accomplished with a suitable buffer wheel rotating in a well containing the tri-

chloroethylene solvent, the well being properly enclosed to minimize contamination of the surrounding atmosphere.

The procedure for adding superimposed titles to black and white prints is the same as that used for adding titles to prints on Eastman Color Print Film.

The method described is offered to the industry as an alternative method for making superimposed titles on processed films using commercially available materials.

It may also find some application in preparation of cells for animation purposes.

\* Further details pertaining to the chemistry of KPR and associated materials are available upon request to the Graphic Reproduction Sales Div., Eastman Kodak Co., Rochester 4, N.Y.

† Fomby, Inc., Georgia, III.

\*\* Coating with a hard streamer or similar hard brush is also a satisfactory method.

†† Trichloroethylene, Toluene and KPR Developer are flammable and care should be taken to avoid their use near open flames or sparks. Both Toluene and Trichloroethylene are toxic. Care should be taken to avoid prolonged breathing of vapor or prolonged or repeated contact with the skin.

When loading a 8mm or 16mm camera with film, thread film carefully so that loop on each side of gate is of proper length; also make sure that film has engaged both of the sprockets.

## KSTP-TV News Cameramen Cited



**AWARD WINNERS**—This smiling crew is national camera team of KSTP-TV, Minneapolis, which was given special award for "ingenuity and creativity" by Encyclopedia Britannica, The National Press Photographers Association, and the University of Missouri. They are: Snowdon, back row, left to right—John Spahr, Kevin Price, Dick Peters, Leslie Brundage, Ken Connel, Jr. Kestling, left to right—Brad Jacobel, Skip Nelson and Roger Krupp, Jr.

## MEASURING LIGHT

(Continued from Page 377)

The lumen is thus a measure of light flow, just as, in electrical units, the ampere is a measure of the rate of current flow.

A foot-candle measures the rate at which light pulses fall on a surface of any area, all points of which are located a distance of one foot from a source of one candlepower. If this surface is one square foot, it receives light pulses at the rate of one lumen. Thus, the illumination in foot-candles, multiplied by the area in square feet of the object, gives the total lumens over that area.

Foot-lamberts is the unit of "brightness" ordinarily used to define the amount of light per area reflected from green (for object in photography). A perfect diffusing surface reflecting light at the rate of one lumen per square foot is said to have a brightness of one foot-lambert in all directions.

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## PHOTOGRAPHIC ASSIGNMENTS

(Continued from Page 360)

• LESTER WHITE, ASC, "Ransom" (Columbia, Inc. with Marvin Schell; Robert Walker, director)

### REPUBLIC STUDIOS

• EDWARD GORMAN, ASC, "Diogenes" (Mark VII Ltd.) with Jack Webb & Ben Alexander; Jack Webb, director. "Pete Kelly's Blues" (Pilot; Mark VII Ltd.) Joe Packer, director

• ARTHUR BAILEY, "Man From Hialeah" (Pilot; Republic Productions) Allen Mann, director

• BENJ. KLING, ASC, "Serpentine" (Republic Productions) Herschel Daugherty, director. "Vincennes Gap" (Republic Productions) Richard Bartlett, director. "Solitary Prisoner" (Republic Productions) John Huston, director

• RAY BENDER, ASC, "Solitary Playhouse" (Republic Productions) John Huston, director

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• WILLIAM SICKLER, ASC, "Bachelor Father" (Republic Productions) with John Forsythe; Sidney Lumet, director. "Love is to Burn" (Goulden Productions) with Barbara Belandier and Hugh Beaumont; Norman Tokas, director. "Jack Benny Show" (Republic Productions) with Jack Benny; Don Wiza, director

• MACK STENZLER, ASC, "Love is to Burn" (Goulden Productions) with Barbara Belandier and Hugh Beaumont; Norman Tokas, director. "Jack Benny Show" (Republic Productions) with Jack Benny; Don Wiza, director

• ERIC TUCKER, ASC, "Solitary Playhouse" (Republic Productions) Earl Bellamy, director. "Special Agent Smith" (Republic Productions) Richard Bartlett, director. "Wagon Train" (Republic Productions) Various directors. "M Squad" (Lighthouse Productions) with Lee Marvin; Charles Gault, director. "Bachelor" (Republic Productions) Earl Bellamy, director. "Wells Fargo" (Goulden Productions) with Dale Roberts; Earl Bellamy, director

• JOHN WARREN, ASC, "M Squad" (Lighthouse Productions) with Lee Marvin; Dale Taylor, director

### AND

• JOSEPH BACOT, ASC, "Federation" (Globe Productions) with James Best & Susan Cummings; Samuel Fuller, director

### KODAK-PATHÉ

• GEORGE BUREAU, ASC, "Mr. Adams & Eve" (Bridge Productions) with Ida Lupino and Howard Duff; Richard Kinnear, director. "Alma Godfrey Theatre" (Four Star Productions) Various directors

• GUY ROSE, ASC, "Travels" (Four Star Productions) with Robert Clary; Dan McDougall, director. "Dark Power" (Four Star Productions) with Dan Fowell; William Fairbank, director. "Alma Godfrey Theatre" (Four Star Productions) Robert Flaherty, director

• LEONARD SACKS, ASC, "Wanted Dead or Alive" (Four Star Productions) Tom Carr, director

### SUNSET STUDIOS

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• TONY TUPPINER, ASC, "The Hustler" (In Lane color)

• MILTON KRASNER, ASC, "A Certain Smile" (CinemaScope & Color) with Bette Midler and Christine Ebersole; Jean YVES, director. "The Remarkable Mr. Pennypacker" (CinemaScope & DeLuxe color) with Gail Patrick and Dorothy McGuire; Henry Levin, director

• JOE MCDONALD, ASC, "The Hell Bent Kid" (CinemaScope) with Hugh O'Brian and Debra McMichael; Gordon Douglas, director

• WILLIAM MILLER, ASC, "The Diary of Anne Frank" (CinemaScope) with Miké Parkes and Joseph Schildkraut; George Stevens, producer-director

(Continued on Page 384)

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# PHOTOGRAPHIC ASSIGNMENTS

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• **OSWALD MORRIS, "The Tents of Heaven"** (D. F. Zaslavsky, Producer, CameraScope, Deluxe color, shooting in French Equatorial Africa) with Trevor Howard, Egon Pflum and Juliette Gréco. John Huston, director.

• **WALTER STRECH, "Frontier Gun"** (Royal Film) with John Agar and Rustin MacLaine. Paul Landres, director.

• **FRANKLIN YOUNG, "The Inn of the Sixth Happiness"** (CameraScope, Deluxe color, shooting in London) with Ingrid Bergman, Cate Burleigh, and Robert Duvall. Mark Robson, director.

## UNIVERSAL-INTERNATIONAL

• **ARTHUR ARNOLD, ASC, "Badmen, Big, and Marlowe commercials"** Will Cowan, director.

• **IRVING GLASSBERG, ASC, "Lunar City and Woodmen best commercials"** Jack Danah, director.

• **PHILIP LATIMER, "Woodmen best commercial"** Jack Danah, director.

• **RONALD METTY, ASC, "Master in the North"** with Arthur Franz and Jeanne Moore. Arnold, director. "Sag Blow in Texas" with Caldon Miller and Charles Drake. Barry Kofke, director.

• **CLIFFORD STINE, ASC, U. S. Savings Bonds and "Candy commercials"** Will Cowan, director.

## WARNER BROS.

• **ELMER CARTER, ASC, "Bell Telephone Service"** Omer Crump, director.

• **CONY DE PUA, ASC, "Room for one More"** (Pilot) Leslie Manheim, director. "Maverick" with Jim Garner. Various directors.

• **RUSSELL HANAN, ASC, "His Boys"** (Amateur Productions, WarnerColor) with John Wayne and Dean Martin. Howard Hawks, producer-director.

• **MICHAEL KELLER, "John Paul Jones"** (Tech model; John Paul Jones Productions), shooting in Spain with Robert Stack, Charles Colburn and Euse O'Donnell. John Farrow, director.

• **HAROLD LINTNER, ASC, "Dance Teachers"** (WarnerColor) with Tab Hunter and Glynis Verdon. George Abbott & Stanley Donen, production-directors.

• **J. PETERILL MALLER, ASC, "Kinky Boots"** (WarnerColor) with Tab Hunter and Glynis Verdon. Paris best and Amateur commercials. Thomas Armstrong, director.

• **FRANK FLANER, ASC, "The Man's Story"** (WarnerColor, Fred Zimmerman Prod., shoot on in Rome) with Audrey Hepburn and Diane Ladd. Euse Fred Zimmerman, director.

• **HAROLD STINE, ASC, "Maverick"** with Jim Garner. Richard Barz, director. "Sugar Foot" with Will Hutchins, Monte Paterson, director.

• **ELMER STANGLING, ASC, "Amateur Master"** (Techmodel, Technicolor) with Ronald Russell and Forrest Tucker. Marion DelCorte, director.

• **ELMER WOOLLEY, ASC, "Maverick"** with Jim Garner. Various directors.



CHARLES LANG, ASC, (far left) of WarnerColor camera and his assistants Kyma and Ken Reed (at his left) prepare to "roll" the camera following rehearsal of scene for Paramount's "The Manchurian Candidate." Others, left to right, are Anthony Perkins, Robert Morris, dialogue coach William Ross, Shirley MacLaine, Patsy Wilson, and director Joseph Anthony.



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